

# MATERIAL SAFETY DATA SHEET (MSDS)



Zhangjiagang Yaru Chemical Co., Ltd.

China phosphate ester flame retardant production and export manufacturers

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## Tris(2-chloroisopropyl)phosphate (cas 13674-84-5) MSDS

### MATERIAL SAFETY DATA SHEET

Preparation Date: October 24, 2006

### SECTION 1 ?? PRODUCT AND COMPANY IDENTIFICATION

Product identifier: IPF PROFESSIONAL GUN FOAM

Chemical family: Mixture of phosphate, isocyanate and propellants.

Product use: Aerosolized, moisture curing, urethane foam used for sealing against passage of air, water, gases, dust, fibers, sound, rodents, pests, radon and odors.

Manufacturer's name and address: USADistributor:

Hago Chemotechnik GmbH & Co. Todol Products Inc.

Bodensee Strasse 217 P.O. Box 398

D-81243 20 Charles Street

Munich, Germany Natick, MA, U.S.A., 01760

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### SECTION 2 ?? COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients CAS #

% (weight)

ACGIH

TLV - TWA

OSHA

PEL

Tris (2-chloroisopropyl) phosphate 13674-84-5 10 ?? 25 N/Av N/Av

Polymethylene polyphenyl isocyanate 9016-87-9 2.5 ?? 10 \*0.005 \*0.02 ppm

ppm

(PMPPI) (Ceiling)

Isobutane 75-28-5 2.5 ?? 10 \*1000 ppm N/Av

Propane 74-98-6 2.5 ?? 10 \*1000 ppm 1000 ppm

Dimethyl ether 115-10-6 2.5 - 10 1000 ppm N/Av

(AHA

WEEL)

\*Notes: The ACGIH TLV's listed above for Isobutane and Propane are for ??Aliphatic hydrocarbon gases??. The ACGIH TLV and OSHA PEL listed above for Polymethylene polyphenyl isocyanate (PMPPI) are for ??Methylene bisphenyl isocyanate (MDI)??, one of the main components of PMPPI.

This material is classified as hazardous under OSHA regulations (29CFR 1910.1200).

### SECTION 3 ?? HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW

Black, aerosolized viscous liquid, which becomes a foam upon release from the container.

Weak, characteristic, earthy / musty odor.

Danger! Flammable aerosol. Contents under pressure. Container will explode if heated. Reacts slowly with water.

May polymerize if heated to high temperatures or if exposed to incompatible materials. Poison. Harmful or fatal if inhaled. Can cause lung injury. Inhalation could cause headache, nausea, dizziness or other central nervous system. May cause respiratory tract irritation. May cause skin and eye irritation. May cause severe allergic skin and respiratory sensitization.

#### \*\*\*POTENTIAL HEALTH EFFECTS\*\*\*

Target organs: Eyes, skin, respiratory system, digestive system, central nervous system.

Routes of exposure: Skin contact, eye contact, inhalation.

Signs and symptoms of short-term (acute) exposure:

Inhalation: Inhalation of vapors may cause coughing, shortness of breath, headache and dizziness. In confined or poorly ventilated areas where the vapor concentration is very high, product may act as an asphyxiant and cause increased breathing and pulse rates, fatigue, nausea, vomiting and unconsciousness. If mists are formed, may cause nasal and respiratory tract irritation. Symptoms may include sore throat, runny nose, wheezing and chest pain. If higher concentrations of mists are inhaled, could result in lung inflammation, bronchitis and pulmonary edema (fluid

accumulation).

Skin: Direct skin contact may cause mild irritation, skin discoloration (staining) and hardening. If product is sprayed directly onto the skin, symptoms of frostbite may be experienced including numbness, prickling and itching.

#### SECTION 3 HAZARDS IDENTIFICATION Continued

Signs and symptoms of short-term (acute) exposure (continued):

Eyes: Direct eye contact may cause mild irritation. Symptoms may include redness and tearing.

Direct contact could also cause freezing of the eye.

Ingestion: Ingestion may cause irritation and / or corrosive damage in the mouth, throat and stomach.

Symptoms may include abdominal pain, nausea and vomiting.

Chronic effects: Repeated or prolonged inhalation of very low levels, may result in severe and permanent respiratory impairment.

Conditions aggravated by exposure: May aggravate pre-existing eye, skin and respiratory disorders.

Carcinogenic status: See TOXICOLOGICAL INFORMATION, Section 11.

Additional health hazards: Possible severe sensitizer. For further information, see TOXICOLOGICAL INFORMATION, Section 11.

Potential environmental effects: See ECOLOGICAL INFORMATION (Section 12).

#### SECTION 4 FIRST AID MEASURES

Inhalation: Immediately remove person to fresh air. If breathing is difficult, oxygen may be administered by qualified personnel. Obtain medical attention immediately.

Skin contact: Immediately remove contaminated clothing. Wash skin with mild soap and water. Some mild solvents such as mineral spirits, paint thinner, acetone (e.g. Pur Clean) or nail polish remover may help in removing uncured foam. Follow all recommended precautions when using these types of solvents. Obtain medical attention immediately. Launder clothing before reuse.

Eye contact: Immediately flush eyes with running water for a minimum of 20 minutes. Obtain medical attention immediately.

Ingestion: If swallowed, do NOT induce vomiting. Have victim drink one glass of water, to dilute material in stomach. Obtain medical attention immediately. Never give anything by mouth to an unconscious or convulsing person.

Note to Physicians: Asthmatic-like symptoms, if manifested, may develop immediately, or be delayed for up to several hours. Following severe exposure, medical follow-up should be monitored for at least 48 hours.

#### SECTION 5 FIRE FIGHTING MEASURES

Fire hazards/conditions of flammability: Flammable aerosol. Cured foam will burn if in contact with direct flame, but is self-extinguishing. Product may react vigorously with water at temperatures above

122 F (50 C). Closed containers are contained under pressure and will explode if exposed to excess heat or flame.

Flammability classification (OSHA 29 CFR 1910.1200): Flammable aerosol.

Flammability test (ASTM E 84): Flame spread index = 25; Smoke density = 210.

Flash point (Method): N/A

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Auto-ignition temperature: > 446 F (propellant)

Lower flammable limit (% by vol.): 1.5 (propellant)

Upper flammable limit (% by vol.): 18.6 (propellant)

Explosion data: Sensitivity to mechanical impact / static discharge: Not expected to be sensitive.

Oxidizing properties: None known.

Suitable extinguishing media: Use foam, carbon dioxide, dry chemical or water fog. If foam from product has been released, use water with caution since the reaction with water can be vigorous at higher temperatures.

Special fire-fighting procedures/equipment: Do not enter fire area without proper protection.

Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece. Shield personnel to protect from venting, rupturing or bursting cans. Move containers from fire area if it can be done without risk. Water spray may be useful in cooling equipment exposed to heat and flame.

Hazardous combustion products: Carbon oxides, nitrogen oxides, hydrogen cyanide, phosphorous oxides, hydrogen chloride and other irritating fumes and smoke.

#### SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions: Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. All persons dealing with clean-up should wear the appropriate chemically protective equipment. Keep all other personnel upwind and away from the spill/release. Refer to Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION, for additional information on acceptable personal protective equipment.

Environmental precautions: Ensure spilled product does not enter drains, sewers, waterways or confined spaces.

Spill response/Cleanup: Eliminate all sources of heat, sparks and flame. Increase ventilation in area of

release to prevent the build-up of flammable atmospheres. Stop leak if you can do so without risk. Allow released foam to cure and solidify. Shovel or scrape up cured foam and place into suitable, labeled containers for later disposal. If liquid concentrate is released, contain and absorb any spilled liquid concentrate with inert, non-combustible absorbent material (e.g. sand). Then place absorbent material into a suitable, labeled container for later disposal (see Section 13). Contaminated absorbent material may pose the same hazards as the spilled product. Notify the appropriate authorities as required.

Prohibited materials: None known.

Special spill response procedures: If a spill/release in excess of EPA reportable quantity is made into the environment, immediately notify the national response center in the United States (phone: 1-800-424-8002).

EPA/CERCLA Reportable quantity (RQ): None reported

#### SECTION 7 ?? HANDLING AND STORAGE

Safe handling procedures: This material is a flammable, toxic aerosol. Medical supervision of employees who come into contact with respiratory sensitizers is recommended. Persons with asthmatic-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or sensitization should be excluded from working with this product. Once a person is sensitized, no further exposure to the material that caused the sensitization should be permitted. Wear protective equipment during handling. Use in a well ventilated area. Stand upwind of all foaming operations. Keep away from sources of heat, direct flame or other ignition sources. Avoid moist conditions, until the product is used. Do not puncture or incinerate containers. Avoid generating high concentrations of vapours or mists. Avoid contact with eyes, skin or clothing. Keep container closed when not in use. Wash hands before eating, drinking, smoking or use of toilet facilities. Launder contaminated clothing before reuse.

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Storage requirements: Store out of reach and away from children. Store in a cool (64 - 72 F), dry, well-ventilated area away from sources of heat, ignition and sunlight. Never store the product in direct

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sunlight, or at temperatures exceeding 120 F. Keep away from incompatible materials (see Section 10). Inspect containers periodically for damage or leaks. No smoking in the area. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel.

Special packaging materials: Always keep in containers made of the same materials as the supply container.

#### SECTION 8 ?? EXPOSURE CONTROLS AND PERSONAL PROTECTION

Ventilation and engineering controls: Use in well-ventilated areas only. Provide suitable ventilation to maintain air contaminants below exposure limits.

Respiratory protection: Respiratory protection is required if the airborne concentration exceeds exposure limits. When concentrations exceed the exposure limits specified, use NIOSH/MSHA-approved air-purifying respirators. Advice should be sought from respiratory protection specialists.

Skin protection and other protective equipment: Protective gloves impervious to the material must be worn during use. Confirmation of what type of material is most suitable for the intended application, should be obtained from glove suppliers. Additional impervious protective clothing is recommended to prevent skin contact. An eyewash station and safety shower should be made available in the immediate working area.

Eye / face protection: Use chemical splash goggles. Contact lenses should not be worn.

General hygiene considerations: Do not inhale vapors and mists. Avoid contact with eyes, skin and clothing. Do not eat, drink or smoke when working. Upon completion of work, wash hands before eating, drinking, smoking or use of toilet facilities. Remove soiled clothing and wash it thoroughly before reuse. Do not allow work clothing to be removed from the workplace.

Permissible exposure levels: For individual ingredient exposure levels, see Section 2.

#### SECTION 9 ?? PHYSICAL AND CHEMICAL PROPERTIES

Physical state, odor and appearance: Black, aerosolized viscous liquid, which becomes a foam upon release from the container. Weak, characteristic earthy, musty odor.

Specific gravity: ~ 1.1

Solubility in water: Not miscible. Volatiles (% by weight): N/Av

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Vapor pressure: 79.8 ?? 87 psi @ 68 F. Vapor density (Air = 1): N/Av

Boiling point: N/Av Freezing point: N/Av

Evaporation rate (n-Butyl acetate = 1): N/Av pH: N/Av

#### SECTION 10 ?? REACTIVITY AND STABILITY DATA

Stability and reactivity: Stable under the recommended storage and handling conditions. May

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polymerize if heated above 122 F (50 C). Reacts slowly with water at normal temperatures.

Reaction is more vigorous at higher temperatures.

Hazardous polymerization: Uncontrolled, exothermic polymerization may occur on contact with

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incompatible materials or when exposed to temperatures exceeding 347 °F (175 °C).

Conditions to avoid: Heat, open flame, other sources of ignition and direct sunlight.

Materials to avoid (incompatibles): Bases (e.g. Sodium hydroxide, Potassium acetate), amines, alcohols, acids, amides, some metal compounds, phenols, water and other materials.

Hazardous decomposition products: 4,4-Methylene dianiline is formed as an intermediate product in the reaction with water. Refer also to Hazardous Combustion products, Section 5.

#### SECTION 11 TOXICOLOGICAL INFORMATION

Toxicological data: There is no available data for the product itself, only for the ingredients. See below for individual ingredient acute toxicity data.

Ingredients LC (4hr)

50

LD (mg/kg)

50

inh, rat

oral, rat

dermal, rabbit

Tris (2-chlorisopropyl) 3 1500 > 2000

5000 mg/m

phosphate

Polymethylene polyphenyl 3 > 10,000 > 5000

490 mg/m

isocyanate (PMPPi)

Isobutane N/Av N/Ap N/Ap

Propane N/Av N/Ap N/Ap

Dimethyl ether N/Av N/Ap N/Ap

Carcinogenicity: None of the ingredients listed are classified by IARC, ACGIH, NTP or OSHA as carcinogenic.

Reproductive effects, Teratogenicity, Mutagenicity: None known.

Sensitization to material: May cause severe respiratory sensitization with asthmatic symptoms such as wheezing and chest tightness. May cause severe skin sensitization with allergic contact dermatitis symptoms such as swelling, rash and eczema.

Other important hazards: CNS depression may result from exposure.

Synergistic materials: Not available.

#### SECTION 12 ECOLOGICAL INFORMATION

Ecotoxicological information: The ecological characteristics of this product have not been fully investigated. The product should not be allowed to enter drains or water courses or be deposited where it can affect ground or surface waters. Do not discharge product unmonitored into the environment. Insoluble in water, and will react with water to produce carbon dioxide, and inert, non-biodegradable solids.

Chemical fate information: There is no data available on the product itself.

#### SECTION 13 DISPOSAL CONSIDERATIONS

Handling for disposal: Empty containers may contain product residue or vapors. Do not puncture or incinerate empty containers. Handle according to recommendations listed in Section 7.

Methods of disposal: Dispose in accordance with all applicable federal, state, provincial and/or local regulations. Contact your local, state, provincial and/or federal environmental agency for specific rules.

RCRA: If this product, as supplied, becomes a waste, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. Under the RCRA, it is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state and federal environmental agencies.

#### SECTION 14 TRANSPORTATION INFORMATION

US 49 CFR information:

Proper Shipping Name: Aerosols

Hazard Class - Primary: 2.1

Identification No.: UN1950

Packing Group: Not applicable

Label Codes: 2.1

RQ LBS: None.

RQ Components: None.

Marine Pollutant: None.

Special Transportation Notes: For shipments by ground within the United States, the Limited Quantity or Consumer commodity exceptions may apply. Under the US 49 CFR, refer to Sections

173.306 and 173.307 for additional exception requirements.

#### SECTION 15 ?? REGULATORY INFORMATION

US Federal Information:

TSCA information: All ingredients are listed on the TSCA inventory.

CERCLA Reportable Quantity (RQ) (40 CFR 117.302): None reported.

SARA TITLE III:

Sec. 302, Extremely Hazardous Substances, 40 CFR 355: No Extremely Hazardous Substances are present.

Sec. 311 and 312, MSDS Requirements, 40 CFR 370 Hazard Classes: Immediate (Acute); Delayed (Chronic); Fire Hazard; Pressure Hazard. Under SARA Sections 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds for extremely hazardous substances are 500 pounds or the individual chemical's threshold planning quantity (TPQ), whichever is lower; and 10,000 pounds for all other hazardous chemicals.

Sec. 313, Toxic Chemicals Notification, 40 CFR 372: This material may be subject to SARA notification requirements, since it contains Polymethylene polyphenyl isocyanate, a Toxic Chemical constituent above its de minimus concentration.

US State Right to Know Laws:

California Proposition 65: To the best of our knowledge, this product does not contain any chemicals known to the State of California to cause cancer or reproductive harm.

New Jersey Labeling Requirements: This product contains the following substances that may be required to be disclosed on product labeling:

Chemical Name CAS #

% (weight)

New Jersey Hazardous Substance

No

Tris (2-chlorisopropyl) phosphate 13674-84-5 10 ?? 25

Yes

Polymethylene polyphenyl isocyanate (PMPPi) 9016-87-9 2.5 ?? 10

Yes

Isobutane 75-28-5 2.5 ?? 10

Yes

Propane 74-98-6 2.5 ?? 10

Yes

Dimethyl ether 115-10-6 2.5 - 10

International Information:

Canadian WHMS Classification: Class A (Compressed gas); Class B5 (Flammable aerosols); Class D1A (Materials Causing Immediate and Serious Toxic Effects, Very Toxic Material), Class D2A (Materials Causing Other Toxic Effects, Very Toxic Material), Class D2B (Materials Causing Other Toxic Effects, Toxic Material).

Canadian CEPA information: All ingredients are present on the DSL.

#### SECTION 16 ?? OTHER INFORMATION

HMI-ES Rating:

0 - Insignificant 1 - Slight 2 - Moderate 3 - High 4 ?? Extreme \* - Chronic

Hazard

Health: \*3 Flammability: 3 Reactivity: 1

Legend: ACGIH: American Conference of Governmental Industrial Hygienists

CAS: Chemical Abstract Services

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980

CFR: Code of Federal Regulations

DOT: Department of Transportation

DSL: Domestic Substances List

EPA: Environmental Protection Agency

HSDB: Hazardous Substances Data Bank

IARC: International Agency for Research on Cancer

N/Ap: not applicable

N/Av: not available

NIOSH: National Institute of Occupational Safety and Health

NTP: National Toxicology Program

OSHA: Occupational Safety and Health Administration

PEL: Permissible Exposure Limit

RCRA: Resource Conservation and Recovery Act

SARA: Superfund Amendments & Reauthorization Act

TLV: Threshold Limit Values

TSCA: Toxic Substance Control Act

WHMS: Workplace Hazardous Materials Information System

References:

1. ACGIH, Threshold Limit Values and Biological Exposure Indices for 2006.
2. International Agency for Research on Cancer Monographs, 2006.
3. Canadian Centre for Occupational Health and Safety, CCIInfoWeb databases, 2006 (Chempendium, HSDB and RTECs).
4. US EPA Title III List of Lists ?? January 27, 2005 version.
5. California Proposition 65 List ?? September 29, 2006 version.

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Preparation date: October 24, 2006.

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